REMARKS

Claims 1-25 are in this application.

The indication of allowability of claims 14, 15, 20 and 24 is greatly appreciated.

Claim 12, although not indicated to be allowable, was not rejected over prior art.

Claim 12 has been amended to correct the problem the examiner pointed out that "the motor" does not have antecedent basis. Since there was no prior art rejection of claim 12, it is assumed that claim 12 will now be indicated to be directed to allowable subject matter.

Claims 20, 21, and 25 have been withdrawn from consideration as not directed to the elected specie.

At the time of the original election of species, applicants submitted that all claims read on the elected species. The examiner disagreed, saying that claims 20, 21, and 25 do not read on figure 2. This position of the examiner is simply not correct. The examiner's attention is politely directed to the specification at page 24, lines 3-10, which says that in the various figures, parts with the same function have the same reference numerals. Thus, in looking at figure 1, the restriction element is 30 or 30d. In figure 2, the corresponding element is a valve **which intrinsically provides a flow restriction**, and is labeled 30 or 30a, 30b, or 30c. Thus it is

clear that the applicants' claims 21, 22 and 25 include a flow restriction device. This recitation does not necessarily change the structure from what is recited in claim 19. The valve recited in claim 19 certainly would have an intrinsic flow resistance which would change as the flow through it changes. Thus, where claims 21 and 22 recite that the valve device has a flow resistance that depends on the through flow of the fuel passing through the valve device, it is clear that this recitation includes and properly reads on the figure 2 structure.

In the June 5 action, the examiner, rejected claims 1, 7, 17, 18, 19 and 23 under 35 USC 103 as unpatentable over Ishida in view of Fujino et al, claim 16 over Ishida in view of Fujino et al and Learman et al, claims 2-6 and 8-11 over Ishida in view of Fujino et al and Yoshiume et al, and claim 13 over Ishida in view of Fujino et al, Yoshiume et al and Cummins et al.

Thus, all of the rejections depend on the combination of Ishida and Fujino et al providing a valid rejection of claim 1.

This rejection, however, presents some problems. There are three possible interpretations of this rejection:

First, that element 52 is the first pump and 46 the second,

Second, that element 46 is the first pump and 100 the second,

Third, that element 46 is the first pump and 52 the second.

If the examiner should continue to make this same rejection, it would be helpful to know for sure just which of these

interpretations he is considering to be his rejection.

It seems most probable that the first of the above interpretations is the way in which the examiner is looking at the reference. This interpretation, however, does not lead to a proper rejection. The reference to Ishida never indicates that pump 52 is a variable pump, nor do the drawings show pump 52 to be variable. Thus, clearly there is no first variable pump supplying a second pump as is recited in applicants' claim 1. In Ishida there is a variable volume pumped from the second pump 46 to the booster piston 100, but this is controlled by a spill valve 64, not by a variable first pump.

The second way of looking at the reference to Ishida reads the first pump to be 46, and booster piston 100 to be the second pump. Looking at Ishida in this manner, the output from pump 46 does vary. However, reading booster piston 100 as a pump is not a fair reading. All that booster piston 100 does is, via hydraulic means, boost the pressure from line 110, at the correct time, to a higher pressure in line 44 to give a higher injection pressure at the required times. This again is not the same as claimed by applicants, wherein a variable pump supplies a second pump so as to control the output of the second pump.

Under the third scenario of pump 46 being the first pump in Ishida, and 52 the second pump, this reading leads to the fallacy that pump 46 does not supply pump 52.

The examiner has combined the teaching of Ishida with that if Fujino et al, saying that Fujino et al does not teach a second pump. But this is incorrect. Figure 10 of Fujino et al is basically the same as figure 1 of Ishida, except without the booster piston 100. The means for controlling the pressure in Fujino et al is a spill valve 38, substantially the same as that of Ishida. Again, in Fujino et al as well as in Ishida, neither reference teaches the very essence of applicants' invention, that a first, variable pump supplies the second pump according to the engine parameters. None of the cited art provides the operation of a first variable pump supplying a second pump.

Moreover, both of the references to Ishida and Fujino et al rely on the crankshaft of the engine to drive their second fuel pump 46/29 (see Ishida at column 1, lines 63-65 and Fujino et al at column 6, lines 34-35). Without applicants' inventive concept of supplying the maim pump with a varying quantity of fuel by a variable first pump, driving the second pump via the engine crankshaft implies at least one of the following conditions: either a delay in supplying sufficient fuel at very low engine speeds, such as at startup; or an oversupply of fuel at running speeds of the engine, and thus inefficient use of the fuel pump, i.e., lots of fuel being spilled back by a fuel spill valve 64/38. This in turn implies major effort and expense to supply the spill valve(s) 64/38. Applicants, by providing that their

first pump is variable in accordance with inputs from the engine control unit, overcomes both of these potential disadvantages of both Ishida and Fujino et al in a simply and inexpensive manner.

As recited in applicants' specification on page 2, line 23 through page 3, line 15, the much quicker, and more variable adaptation of the fuel supply system of applicants' invention by making the first pump a variable pump, matches the fuel supply to the operating conditions of the engine much better. This provides substantially better fuel supply at the correct pressure and quantity when compared to the prior art, including that of Ishida and Fujino et al.

The examiner has also used the references to Learman et al, Yoshiume et al, and Cummins et al in various of the rejections. But again, none of these references teach a first variable pump supplying a second pump.

The patent to Yoshiume et al does teach an electric motor driven fuel pump which is under the control of the engine control unit 20. Via the output from engine control unit 20, the motor that drives the fuel pump is adjusted to deliver the desired quantity of fuel. But this is not the same as applicants' claimed invention. Adding this teaching to the combination of Ishida and Fujino et al still does not make applicants' claimed invention obvious. For this still does not provide any teaching of supplying the second fuel pump with a varying quantity of fuel

with a first variable pump, as recited in applicants' claims.

Learman et al also teach an electric motor driven fuel pump which is under the control of the engine control unit. Via the output from engine control unit, the motor that drives their fuel pump is adjusted to deliver just slightly more than the desired quantity of fuel. Again, this still is not the same as applicants' claimed invention. Nor does adding this teaching make applicants' claimed invention obvious. Adding this teaching still does not provide any teaching of supplying the second fuel pump with a varying quantity of fuel with a first variable pump, as recited in applicants' claims.

Cummins et al also teaches an electric motor driven fuel pump which is under the control of the engine control unit. The output from engine control unit to the motor that drives the fuel pump is adjusted to deliver the desired quantity of fuel. But this is not the same as applicants' claimed invention, nor does adding this teaching make applicants' claimed invention obvious. Once again, this still does not provide any teaching of supplying the second fuel pump with a varying quantity of fuel with a first variable pump, as recited in applicants' claims.

It is therefore believed that Ishida in view of Fujino et al, even with the addition of Learman et al, Yoshiume et al, or Cummins et al, does not teach or make obvious the claimed subject matter.

Reconsideration and allowance of the claims are courteously solicited.

Respectfully submitted,

Date: October 5, 2001

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Appendix, claim 12 marked up to shown the changes made by this amendment:

12. (Amended) The fuel supply system according to claim 1, in which the first fuel pump (6) is driven by an electric motor (8), and an electrical series resistor (62) is electrically connected in series with the electric motor (8).